DOCUMENT RESUME

ED 241 019 IR 050 627

AUTHOR Janke, Richard V.
TITLE Databases and Search Services North of the Border.
PUB DATE 1 Nov 82
NOTE 18p.; Paper presented at the Online '82 Conference (Atlanta, GA, 1 November 1982).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Databases; Foreign Countries; *Information Retrieval; Newspapers; *Online Systems; *Telecommunications
IDENTIFIERS *Canada; *Packet Switched Networks

ABSTRACT

This paper presents an overview of the major Canadian online systems, which account for approximately 5% of information vendors and databases worldwide. Also described is DATAPAC, Canada's national telecommunications network, and DATAPAC's X.75 interface with TELENET, TYMNET, UNINET, and France's TRANSPAC. The online systems described include: (1) CAN/OLE, the online system of the Canada Institute for Scientific and Technical Information (CISTI), Ottawa, which provides access to some 20 databases of which 9 are Canadian; (2) IDRC/MINISIS, an information retrieval system developed by the International Development Research Centre (IDRC), Ottawa, which is used as a training system because it can be searched without charge by all Canadian online search centers; (3) QL/SEARCH, the online system developed by QL Systems Ltd., Ontario, which provides access to over 60 databases with emphasis on Canadian information; (4) INFO GLOBE, the full-text online version of the Globe and Mail (Toronto), one of Canada's leading newspapers; and (5) INFORMATECH/QUESTEL, a completely French-language online system operated under the auspices of the Quebec government's Ministry of Communications. The importance of Canadian online and telecommunications sytems, both to Canadian searchers and others, is emphasized. A list of the addresses of Canadian online services and a 16-item bibliography are also provided. (Author/ESR)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED241019

DATABASES AND SEARCH SERVICES NORTH OF THE BORDER

by

Richard V. Janke

University of Ottawa

Paper presented at
The Online '82 Conference and Exposition, Atlanta, Georgia: Monday, Nov. 1st, 1982. - at 11:00 am.

IR057627

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Richard V. Janke

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

DATABASES AND SEARCH SERVICES NORTH OF THE BORDER R. V. Janke

1. Introduction

1.1 The Program Information Guide for the Online '82 Conference and Exposition notes that, while American online searchers have the benefit of ready access to a wide array of databases to search, "many of these same searchers know little of the unique systems and services accessible from Europe and Canada". (p. 3) With this in mind, I would like to focus on the current online scene in Canada, with an overview of our major online systems. The systems I will be addressing are: DATAPAC, Canada's national telecommunications network; CAN/OLE; IDRC'S MINISIS; QL Systems; INFOGLOBE and INFORMATECH/QUESTEL.

1.2 Interest outside Canada

Canadian online systems are valuable sources of information for res archers outside Canada, who would like to retrieve documentation, for instance, on Canada's role in international business or markets, Canada's foreign policy vis-à-vis their country's, or on bilingual education and second language learning, a field where Canada is at the leading edge of current research.

1.3 English and French

Within Canada itself, one of the major problems facing online searchers is the retrievability of adequate amounts of Canadian information for research. This is especially true of references in French. Since English and French hold equal status as official languages, this issue is key. While it is a relatively straightforward matter to retrieve citations online in English, this is far from the case for French language materials. For every 100 citations retrieved in English, chances are there will be no more than 5 or 10 in French.

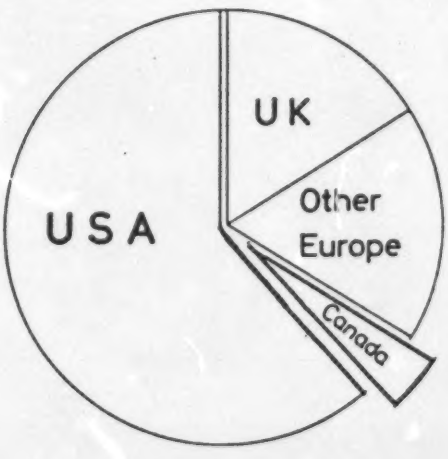
1.4 Summary

In general, the proportion of Canadian online systems to American, British or other systems worldwide is illustrated in Figure 1:

Figure 1

(Transparency) (1)

Origins of Database Producers Internationally



As can be clearly seen, Canada accounts for approximately 5% at best of information vendors and databases worldwide - a very small slice of the pie! This phenomenon is explained in part by the massive preponderance of U.S. systems and databases worldwide, and partly also by Canada's small population, which at 25 million, is less than 1/10 that of the United States. As in publishing, where Canada is a minor industry source, so also it would appear, at first sight, in online searching.

2. DATAPAC

2.1 Background

DATAPAC, Canada's national telecommunications network, is owned and operated by the Computer Communications Group (CCG) of the Trans Canada Telephone System (TCTS). TCTS is itself a division of Bell Canada, Canada's largest fully independent telephone company (no relative of AT&T!). With consolidated sales of some 1.9 billion dollars in 1979 alone, Bell Canada ranks as the second largest telecommunications company in North America. CCG is also affiliated with Bell Northern Research (BNR), the research branch of Bell Canada (2).

2.2 Network design

Any ASCII standard terminal may access the DATAPAC network in half duplex mode, using standard Interactive Interface (ITI) procedures. Terminals are connected via ITI to DATAPAC's Network Interface Machines (NIMs), which transmit data between terminals and the mainframes they access.

DATAPAC is a typical packet switching network, with packet transmission of up to 256 bytes per packet in Canada, and 128 bytes for international service to the U.S.A. and abroad. DATAPAC's low transmission rates are comparable to those currently charged by UNINET and TELENET in the United States.

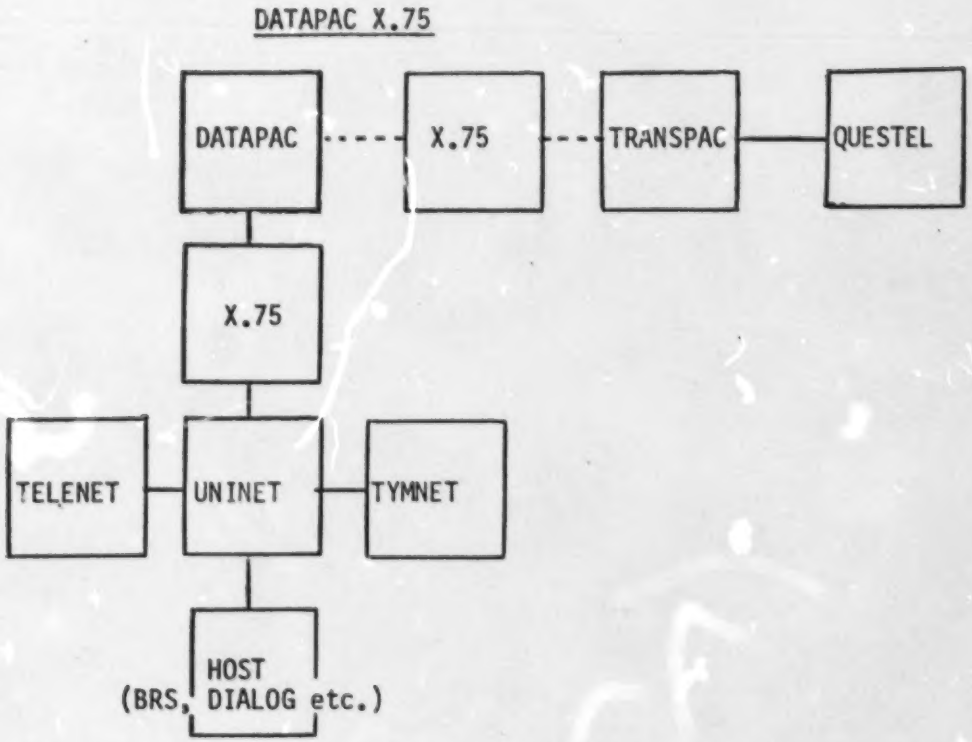
2.3 International protocol X.75

Since September, 1982, DATAPAC has operated according to the International Telephone and Telegraph Consultative Committee's (CCITT) newest protocol, X.75, for public access to international networks from Canada. X.75 allows for several simultaneous DATAPAC calls over any network access line. Thus, Canadian online searchers may, simply by placing a local call, directly dial into TELENET, UNINET or TYMNET and connect to any U.S. host computer, such as BRS, DIALOG or the Dow Jones News Retrieval Service. DATAPAC has also adopted CCITT's recommendation X.121, which establishes an International Numbering Plan for the identification of public addresses of networks and host computers worldwide.

While a DATAPAC X.75 interface has yet to be established with France's TRANSPAC, this link should be in place by October, 1982, or at the latest, by early 1983. Thus, Canadian searchers will soon enjoy ready access to online systems in France, such as QUESTEL, so vital to Canada's special interests as an officially bilingual English - French nation.

DATAPAC's interface with international common carriers is illustrated in Figure 2:

Figure 2



3. CAN/OLE

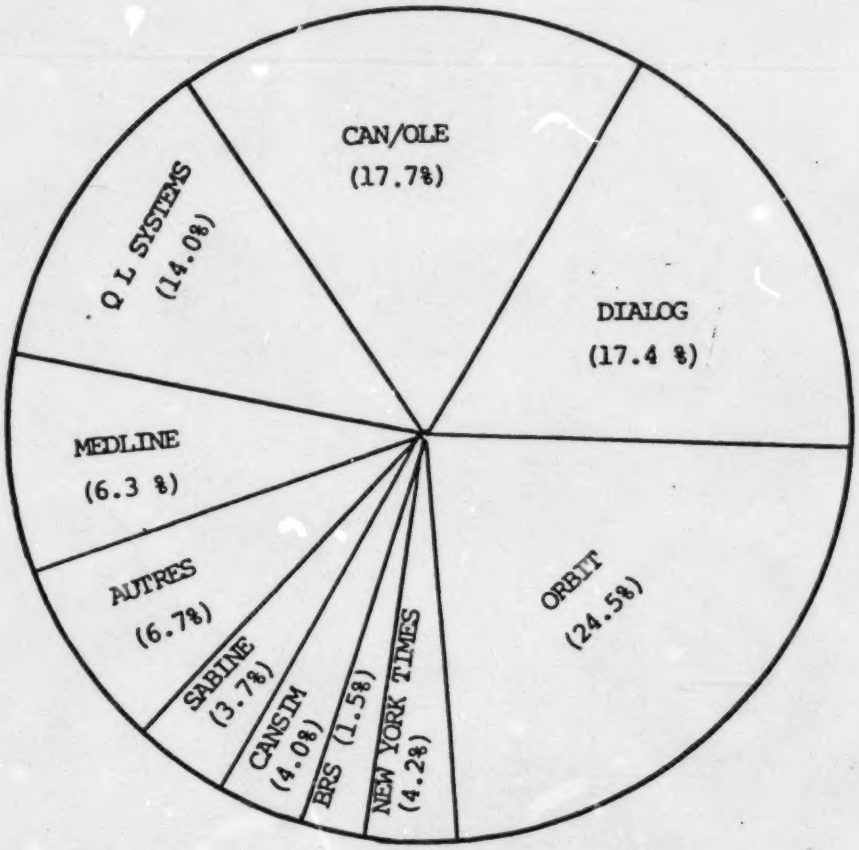
3.1 Background and use in Canada

CAN/OLE, the online system of the Canada Institute for Scientific and Technical Information (CISTI), Ottawa, provides access to some 20 databases, of which nine (9) are Canadian, with almost 13 million references online as of August, 1982. CAN/OLE, which is available only in Canada, serves some 900 subscribers nationwide and has been in operation since 1976. The system is bilingual, that is, you can search on it using either English or French commands. The average cost of searching CAN/OLE databases is C$61/hour or US$46/hour. CAN/OLE also provides an I.L.L. document ordering and messaging facility. It is, according to Deschatelet's 1980 national survey of Canadian online search centres, Canada's most widely used online system after ORBIT, just ahead

of DIALOG, as illustrated here in Figure 3 (3):

Figure 3

OVERVIEW OF CANADIAN ONLINE SEARCH SERVICE MARKET: ONLINE SYSTEMS



3.2 International databases

3.2.1 Of the 20 databases available on CAN/OLE, 11 are major international scientific and technical databases. Examples are: NTIS, Biological Abstracts, GEOREF and the Engineering Index.

3.2.2 Searching international databases on CAN/OLE - factors

Three key factors influence the decision whether to search international databases on CAN/OLE. Response time is generally faster and connect rates lower than for the same databases on American systems, like BRS and DIALOG. But, these two advantages are offset by the fact that CAN/OLE's retrieval software is more limited than that of the major American systems. Thus, while Canadian searchers rely on CAN/OLE for routine subject searches, more complex strategies call for a search on one of the U.S. systems.

3.3 Canadian databases

Of the nine (9) Canadian databases on CAN/OLE, the following deserve special mention -

3.3.1 IEC - the directory of research in Canadian universities supported by the Canadian federal government. 1971 - 97,000 citations

3.3.2 MICROLOG - a multidisciplinary database providing access to Canadian federal, provincial and local government documents, as well as to publications of non-governmental organizations and associations. References found in MICROLOG often cannot be retrieved in any other online system or database. 1971 - 8,700 citations

3.3.3 OON - holdings of CISTI's own catalog, excluding journals. Contains monographs, conference reports and reference materials in science, technology and medicine. Updated biweekly. 160,000 citations

3.3.4 OONL or CANADIANA, published by the National Library of Canada, is a valuable source of information either written in Canada or substantially dealing with Canada. Includes monographs, sheet music and scores, as well as Canadian theses at the masters and doctorate levels, not necessarily indexed in DAI. 1973 - 180,000 citations

3.3.5 UNION - the Union List of Scientific Serials in Canadian Libraries. 51,000 citations

3.5 Online document ordering

One key feature of CAN/OLE is its online document ordering facility. Interlibrary loan requests for photocopies, books or microforms may be placed online, for citations found in any of CAN/OLE's databases, as well as for non-database items, eg. a reference from METADEX, not online on CAN/OLE. There is no charge for placing the order, but a nominal fee of C$2.20 minimum and 22¢ per page applies to photocopies, and $2.20 per fiche. Of over 200,000 documents ordered from CISTI in 1981, fully 25% were ordered online!

4. IDRC/MINISIS

4.1 Background and development

IDRC/MINISIS is an information retrieval system developed in full by the International Development Research Centre (IDRC), Ottawa, Canada. IDRC is a public corporation which receives full federal funding. Some of these funds are earmarked for MINISIS, first made available on a trial basis to six Canadian institutions in April, 1980. Today, over 60 libraries and information centres across Canada search MINISIS. Because it is funded by the Canadian government, search centres in the United States cannot legally search MINISIS (4).

4.2 Free access and training

Federal funding permits all online search centres in Canada to search MINISIS for free! In light of the rather sophisticated software its Hewlett Packard HP 3000 Series IV computer supports, free online access to MINISIS proves a real asset to Canadian searchers, especially novices. The latter are able to search, using a wide range of features normally found only on the large U.S. systems, without having to worry about connect time or offline printout charges. Since MINISIS is now widely available in Canada, it may thus be recommended as an ideal training system for Canadian searchers.

4.3 Databases

4.3.1 International

Of the eight (8) databases on MINISIS, four (4) are non-Canadian. All are developmentally related. They are:

4.3.1.1	ILO, the database of ILO, Geneva	(60,000 citations as of 03.82)
4.3.1.2	FAO, Rome, Italy	(33,000 citations ")
4.3.1.3	UNESCO, Paris, France	(32,000 citations ")
4.3.1.4	UNIDO, Vienna, Austria	(11,000 citations ")

Because of Canada's strong commitment to development issues such as the North South Dialog, IDRC's research focusses primarily on all questions directly affecting developing nations - hence, the need for the above databases.

4.3.2 IDRC's inhouse databases

These are:

4.3.2.1 BIBLIOL, the complete holdings of the IDRC library (35,000 citations as of March, 1982)

4.3.2.2 DEVSISL (Development Sciences Information System), an experimental database concerning the economic and social climate in developing nations (5,200 citations as of 03.82)

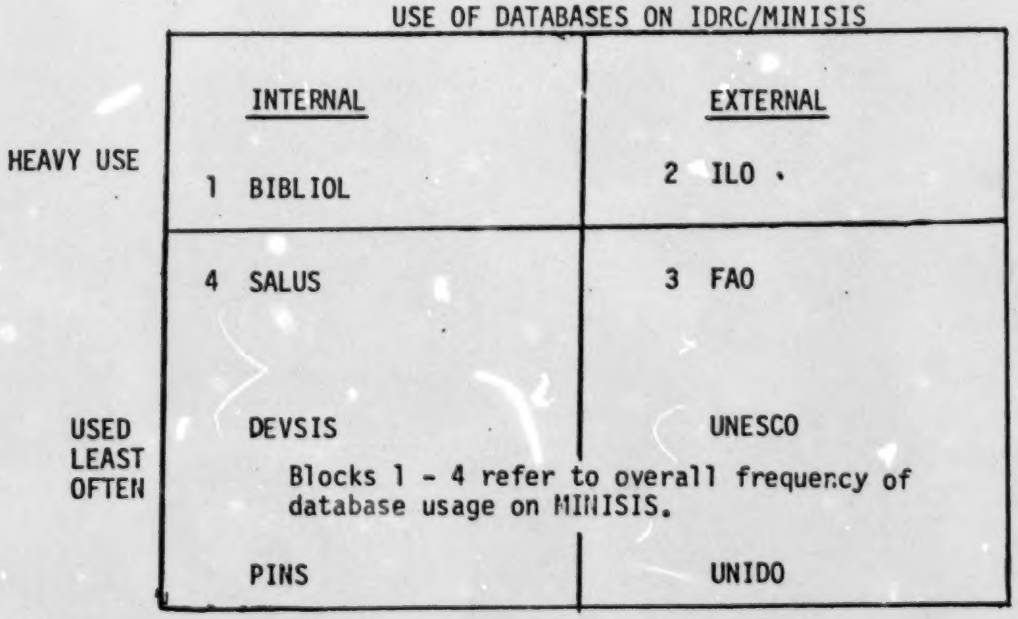
4.3.2.3 SALUS, a database concerned with health care and health manpower in the developing countries (8,000 citations as of 03.82)

4.3.2.4 PINS (Project Information System), first made publicly available in the summer of 1982. This unique database gives details on the approximately 1,400 projects funded by IDRC since its inception in 1970.

Of the four internal databases, BIBLIOL is by far the most often searched in Canada, while of all eight databases on MINISIS, it leads the way, with ILO running a strong second, as illustrated here in Figure 4:

Figure 4

USE OF DATABASES ON IDRC/MINISIS



5. QL/SEARCH

5.1 Background

QL Systems Ltd., incorporated in 1973, grew out of the QUICK/LAW Project at Queen's University, Kingston, Ontario. This project was established in 1968 to investigate the possible uses lawyers could make of an online system. Since then, QL has developed the first ever fully Canadian online service, QL/SEARCH.

5.2 Overview of databases

QL/SEARCH provides online access to over 60 databases concerned with such issues as: Canada's government, Canadian law and legal issues, environment, mining, energy, business, communications and Canadian news, to name a few. Some databases, such as Hansard Oral Questions (HOQ) of Canada's Parliament and NEWSTEX of the Canadian Press Wire Service, are full text, while others, such as Aquatic Sciences and Fisheries Abstracts (ASFA), for which QL is the sole official Canadian distributor, provide abstracts, and still others only bibliographic citations.

5.3 Focus on NEWSTEX

NEWSTEX (CPN online) is an especially fascinating database. CP's wire service stories originate from some 300 reporters and editors representing Canada's 111 major newspapers, including the Toronto Star, the Globe and Mail and Montreal Gazette. Moreover, some 450 private radio and TV stations also contribute.

International news from the wire services of the Associated Press, Reuters and Agence France-Presse provide comprehensive global coverage. Stories reported by CPN are always covered from a Canadian perspective.

At the time of this writing, CPN is retrospective to Jan., 1981. Since retrospective conversion is currently being carried out, CP wire service stories from the beginning of 1974 to the present should be online as of December, 1982, at the latest.

5.4 QL/SEARCH in the United States

5.4.1 Databases

U.S. subscribers to QL will find its databases in the areas of environment, energy and mining, many of which are unique to the system, invaluable for research into such topics as acid rain and coal gasification. Some of these databases are: Metals Abstracts (MET), Mining Technology (MNT) and Energy Projects (ENP).

5.4.2 IN/FORM and WESTLAW

QL/SEARCH has been adopted by IN/FORM, a database service of the Philadelphia Enquirer and the Philadelphia Daily News, available in the U.S.A. at the connect rate of $50.00/hour. IN/FORM also offers a private database service.

WESTLAW, the legal information service of West Publishing, St. Paul, Minnesota, also uses QL/SEARCH software.

5.5 Special features

5.5.1 QL/SEARCH provides several special features online. The most notable of these are: QL's own unique weighted retrieval system, QL's electronic mail and full word processing facilities, and its Mortgage Amortization Service (MORT).

5.5.2 9600 BAUD

But, by far the most exciting development phase QL has embarked on is its adoption of a 9600 BAUD private telecommunications network for QL subscribers in Canada. Unfortunately, this high speed network is NOT available to QL's American subscribers.

For a mere C$90.00/hour, QL can provide its Canadian customers with IBM green phosphor CRT's, complete with highlighting of search terms, and rapid online editing. The only requirement is that each client use 1 hour of connect time per week to QL's computer. This is, in my view, a most exciting development for QL's Canadian subscribers.

6. INFO GLOBE

6.1 The Globe and Mail goes online

The Globe and Mail, Toronto, one of Canada's leading newspapers, is searchable online in its entirety as INFO GLOBE. As an online system, INFO GLOBE is a natural offspring of QL. When the Globe and Mail first went online in November, 1977, it was searchable as one of QL's databases. When in 1979, INFO GLOBE, a division of the Globe and Mail, was established, it took over responsibility for the online version of the newspaper from QL. INFO GLOBE's information retrieval system is quite similar to QL's. One major difference lies in INFO GLOBE's reliance on free text searching, with the option of controlled vocabulary, instead of using QL's weighted retrieval method.

Every article in the Globe and Mail has been online since November, 1977, with the Report on Business added on January 1st, 1978. The database is updated nightly, with the update available 5:00 am. the next morning.

6.2 Other services of INFO GLOBE are -

6.2.1 As a result of an agreement with the New York Times Information Services, as of Jan., 1982, INFO GLOBE has been the official distributor of the INFORMATION BANK and all of its services (eg. Deadline Data on World Affairs and Disclosure) in Canada, while the INFORMATION BANK concurrently distributes INFO GLOBE in the United States.

6.2.2 Since Jan., 1982, INFO GLOBE has been actively participating in a British Columbia pilot project for TELIDON, Canada's videotext system.

6.2.3 As of Aug., 1982, INFO GLOBE has been marketed in Japan.

6.2.4 Since July, 1982, INFO GLOBE has been participating in Bell Canada/ CCG's iNET (Intelligent Network) trials.

6.2.5 MARKETSCAN, a stock exchange service encompassing the Toronto, Montréal, Alberta and Vancouver exchanges in Canada, and the New York and American exchanges in the States, has been online since Nov., 1981. This database provides daily quotes from the previous day's close for any of these exchanges. Quotes for any stock symbol are printed as requested online for 100 days. Several stocks, from any mixture of exchanges, may be searched at once. It is even possible to list <u>all</u> quotations for the most recent

trading day on any of MARKETSCAN's six exchanges. A handy company dictionary is also expandable online, if you know a company's name, but not its stock symbol. This dictionary lists both the stock symbol and the exchange(s) on which the company is traded.

7. INFORMATECH/QUESTEL

7.1 Background and growth

INFORMATECH, Montréal, Québec, Canada, was founded in 1966 as INFORMATECH FRANCE-QUEBEC. A non-profit Québec company, INFORMATECH operates under the auspices of the Québec government's Ministry of Communications. The French Foreign Ministry also contributes funding to INFORMATECH's operations and ongoing database development projects.

INFORMATECH is a completely French-language online system, that is, all of its software is in French, and its Québec databases contain almost solely French-language information - with only a few citations in English. Over the years, INFORMATECH has also distributed in Canada a few key databases originating in France, most notably: FRANCIS, and some of the PASCAL databases.

7.2 Mandate

INFORMATECH is the sole official distributor of all of QUESTEL's approximately 30 databases and of DARC's chemical bonding system in Canada. As a result of a landmark agreement with QUESTEL/DARC in the spring of 1982, INFORMATECH's mandate now covers the following services -

7.2.1 dissemination of French-language databases in Québec and Canada - regardless of content or origin
7.2.2 distribution of Québec databases abroad
7.2.3 development of new uni-language French databases in Québec.

7.3 Québec databases

INFORMATECH offers the following key databases, at the connect rate of C$50/hour or US$37.50/hour -

7.3.1 HISCABEQ: 1966-1980. Québec and Canadian history. 28,000 citations
7.3.2 RADAR: Répertoire analytique d'articles de revues du Québec. 1973 - A general Québec index approximately the equivalent of RGPL. 72,000 citations. INFORMATECH's most frequently searched inhouse database.
UPCOMING DATABASES:
7.3.3 Bii - Manufacturing companies in Québec. Current factual database on major co. activities and trademarks etc. 8,500 citations
To be put online in the spring of 1983
7.3.4 CHOIX: Monographs and A-V materials in French published in Québec. 1964 - 185,000 citations (spring, 1983)
7.3.5 QUEBEC ACTUALITES: Newspaper index to the French Canadian newspapers, Le Devoir, Le Soleil and La Presse. 1966 - 250,000 citations (spring/83)

7.4 INFORMATECH/QUESTEL

7.4.1 Databases

Because Canada has, next to France, one of the largest French speaking populations in the world (some 7.5 million francophones), databases

like URBAMET (town planning), TELEDOC (telecommunications), FRANCIS (social sciences and humanities) and the PASCAL databases are all of prime interest to Canadian researchers as sources of information in French.

With the advent of QUESTEL, INFORMATECH is now the major source of French language information in Canada. Thus, all online search centres in predominantly French speaking areas of the country, including: all of Québec, northern New Brunswick, the city of Ottawa, and parts of eastern Ontario and southern Manitoba, will find INFORMATECH a key, if not esstential, source of online information.

7.5 Special rates for QUESTEL on INFORMATECH

Even more significant is the fact that Canadian online search centres subscribing to INFORMATECH benefit from substantial reductions in online connect rates to all of QUESTEL's databases, thanks to the generous subsidies provided by INFORMATECH. These subsidies fall into two categories:

7.5.1 a 28.5% reduction in the total online connect rate/hour in French francs for all QUESTEL databases

7.5.2 a credit of C$27/hour or US$20/hour for online DATAPAC-TRANSPAC telecommunications charges.

These subsidies afford Canadians significant savings for online searching on QUESTEL. The chart below compares connect rates for 4 QUESTEL databases for Canadian and American subscribers, in American dollars:

Figure 5

CONNECT RATES PER HOUR ON QUESTEL (in US$)

DATABASE	Canadian subscribers	American subscribers
FRANCIS	$33	$58
LOGOS	$43	$76
MEETING AGENDA	$51	$90
URBAMET	$40	$70

7.6 INFORMATECH-QUESTEL/DATAPAC-TRANSPAC

A DATAPAC-TRANSPAC X.75 link is currently being negotiated and should be operational by late 1982. At that time, Canadian searchers will be able to dial directly into the nearest DATAPAC network port, simply by placing a local call, to search QUESTEL online.

CONCLUSIONS

8. In section 1.4 I stated that Canada, at first sight, seemed not to be in the forefront of the international online scene. In fact, nothing could be further from the truth. Amongst other things, Canada is:

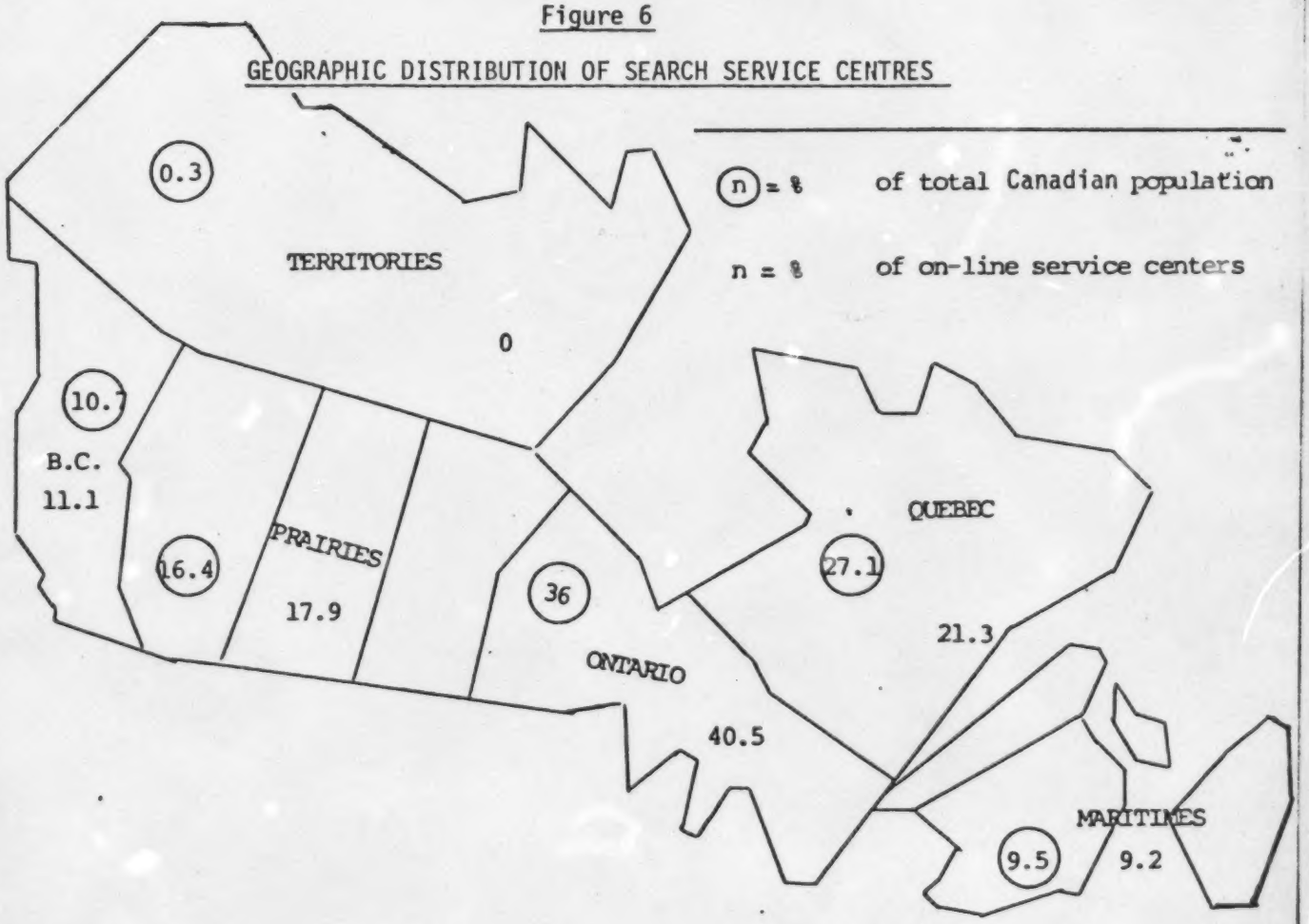
8.1 A major consumer of online services. According to Deschatelet's 1980 national survey, some 161,300 online searches were run in 1978-1979 alone in Canada (Deschatelets, p. 7), with some 1185 online subscribers and 380 search centres in Canada by the spring of 1979 (p. 13). Distribution of online activities in Canada is illustrated in Figure 6 below:

8.2 Canada is active in developing online systems and databases, as attested by the five (5) major Canadian systems and their numerous databases outlined in this paper.

8.3 Canada is a world leader in telecommunications research and networking, as demonstrated by Bell Canada's huge investment in DATAPAC and related telecommunications applications, such as iNET.

Figure 6

GEOGRAPHIC DISTRIBUTION OF SEARCH SERVICE CENTRES



REFERENCES

(1) Source: James L. Hall & Marjorie J. Brown. Online bibliographic databases: an international directory. 2nd. ed. London, ASLIB, 1981. p. xxiii

(2) Online search on DATAPAC conducted by the author on PREDICASTS PROMT (PTSP) on BRS, July, 1982.

(3) Gilles Deschatelets. Bibliography (10). p. 15

(4) Faye A. Daneliuk. Bibliography (9) .

August 25, 1982

ADDRESSES OF ONLINE SERVICES IN CANADA

(1) CAN/OLE,
CISTI,
National Research Council of Canada,
Ottawa, Ontario,
Canada, K1A 0S2
613/993-1210
Telex 0533115

(2) DATAPAC

(a) Requests for DATAPAC brochures, bulletins, users' manuals, specifications and technical papers should be directed to the following central distribution centre:

Data Networks Resource Centre,
Computer Communications Group,
Trans Canada Telephone System,
Room 1890,
160 Elgin Street,
Ottawa, Ontario,
Canada, K1G 3J4

(b) DATAPAC User Group,
P.O. Box 1079,
Station B,
Ottawa, Ontario,
Canada, K1P 5R1
613/567-2491

(3) IDRC/MINISIS,
International Development Research Centre (IDRC),
P.O. Box 8500,
Ottawa, Ontario,
Canada, K1G 3H9
613/996-2321
Telex 0533753

(4) INFO GLOBE,
The Globe and Mail,
444 Front Street West,
Toronto, Ontario,
Canada, M5V 2S9
416/598-5250
Telex 06219629

ADDRESSES OF ONLINE SERVICES
(con't)

(5) INFORMATECH/QUESTEL,
3467 rue Durocher,
3rd. Floor/3e étage,
Montréal, Québec,
Canada, H2X 2C6
514/845-2206

(6) QL Systems Limited,
Head Office,
797 Princess Street,
Kingston, Ontario,
Canada, K7L 1G1
613/549-4611

DATABASES AND SEARCH SERVICES NORTH OF THE BORDER

BIBLIOGRAPHY

(1) Chang, Susan "SIRLS: an Information Retrieval System for the Sociology of Leisure and Sport", in Bulletin of the American Society for Information Science. Vol. 4(2), p. 14. Dec., 1977

(2) Clinton, Marshall "International packet switching: its impact on on-line bibliographic searching", in Canadian Library Journal. Vol. 35(3), p. 185 - 193. June, 1978

(3) _____. "Online searching in Canada - the DATAPAC interface", in Online. Vol. 2(3), p. 41 - 51. July, 1978

(4) _____. "Using European systems from a North American library", in Online. Vol. 4(2), p. 22 -27. April, 1980

(5) Clipsham, W.W., and others. DATAPAC: Four papers presented to the Third International Conference on Computer Communications: Toronto, Canada, August, 1976. Ottawa, The Computer Communications Group (CCG), Trans Canada Telephone (TCTS), n.d.

(6) The Computer Communications Group (CCG). DATAPAC: a packet assembly/disassembly protocol specification for binary asynchronous communications: point-to-point contention mode. Ottawa, CCG/TCTS, May, 1980

(7) Daneliuk, Faye A. Design and implementation of a data base system for bibliographic applications on a minicomputer. Montréal, Québec: McGill University, School of Computer Science, 1979. 1. vol. (various pagings)

(8) _____. IDRC's minicomputer-based bibliographic information system. NATO. Advisory Group for Aerospace Research and Development. Neuilly-sur-Seine, France, 1978. Paper # 4, p. 1-9

(9) _____. Information retrieval and library management: an interactive minicomputer system. IDRC TS14e. Ottawa, International Development Research Centre, 1978. 16p.

(10) Deschatelets, Gilles H. A survey of on-line search service centers in Canada. Québec, Québec: Laval University, March, 1980. ERIC document: ED 194053

(11) Edwards, A. & Wild, K. MINISIS: a minicomputer based bibliographic system. Ottawa, International Development Research Centre, 1979. 10 p.

(12) Janke, Richard V. & Wong, Maureen. "Online in Canada", in Online. Vol. 5(3), p. 12 - 29. July, 1981

(13) Lawton, Stephen B. The diffusion of automation in the technical and public service areas of libraries in post-secondary educational institutions in Canada. Paper presented at the Online Reference Services Workshop, University of Toronto, School of Continuing Studies, March 14 & 15, 1980

BIBLIOGRAPHY

(cont.)

(14) Lawton, Stephen B. "ERIC in Canada: problems and prospects", in Canadian Library Journal. Vol. 35(1), p. 17 - 23. Feb., 1978

(15) Nash, Mary M. "The Globe and Mail database -- a Canadian first", in Online Review. Vol. 3(4), p. 367 - 371. Dec., 1979

(16) Sly, Maureen Improving accessibility to development literature: some activities of the International Development Research Centre (IDRC). Ottawa, International Development Research Centre, the Library, 1981. 19 p.